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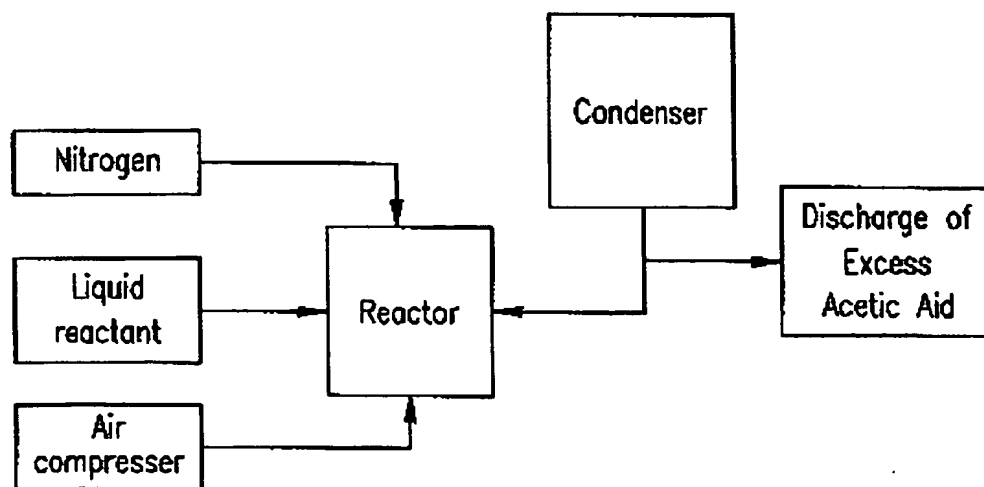
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(54) Title: PREPARATION METHOD OF NAPHTHALENE DICARBOXYLIC ACID



(57) Abstract: The present invention relates to a method for the preparation of naphthalene dicarboxylic acid, and more particularly, to a method for the preparation of naphthalene dicarboxylic acid by oxidizing dimethylnaphthalene with oxygen in air in the presence of acetic acid solvent using the metal catalysts of cobalt and manganese, and using bromine as a reaction initiator, wherein the temperature of said oxidation reaction is 155 to 180 °C. The method for the preparation of naphthalene dicarboxylic acid of the invention enables the preparation of naphthalene dicarboxylic acid having high purity with a high yield in an economical way at a low temperature.

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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/KR 03/00883-0

## CLASSIFICATION OF SUBJECT MATTER

IPC<sup>7</sup>: C07C 63/38, C07C 51/265

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC<sup>7</sup>: C07C 63/38, C07C 51/265

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

STN:CAS

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 1999/018059 A1 (Eastman Chemical Company) 15 April 1999 (15.04.1999) <i>claims, page 3, line 28 - page 6, line 26</i>	1-6
P,X	WO 2003/022791 A1 (Lonza Spa) 20 March 2003 (20.03.2003) <i>claims, example.</i>	1-3,4,5,7
Y	US 5183933 A1 (Jon J. Harper et al.) 2 February 1993 (02.02.1993) <i>claims, examples, table III.</i>	1-6
Y	US 4950786 A1 (Paul A. Sanchez et al.) 21 August 1990 (21.08.1990) <i>claims, examples</i>	1-3,5
Y	JP 06 279356 A2 (Mitsubishi Petrochemical Co. Ltd) 4 October 1994 (04.10.1994) (abstract) retrieved on 12.3.2004 retrieved from STN CAS Database	1,2,7

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Patent document cited in search report			Publication date	Patent family member(s)			Publication date
JP	A	6279356A 2		none			
US	A	4950786	1990-08-21	CA	C	1326860	1994-02-08
				KR	B	137665	1998-04-30
				MX	B	169910	1993-07-30
				EP	A	0329273	1989-08-23
				DE	T	68925222T	1996-05-15
US	A	5183933	1993-02-02	SG	A	94682	2003-03-18
				JP	B	3390169B2	2003-03-24
				DE	T	69230967T	2000-12-14
				ES	T	2145749T	2000-07-16
				DE	D	69230967D	2000-05-31
WO	A	19990180 59		none			
WO	A	20030227 91		none			